The City of BARRIE

STAFF REPORT ENG002-16
March 7, 2016

TO:	**GENERAL COMMITTEE**
SUBJECT:	**FOSTER DRIVE AREA SANITARY SERVICING AND STORMWATER MANAGEMENT CLASS EA**
WARD:	**WARD 8**
PREPARED BY AND KEY CONTACT:	**B. GRATRIX, P. Eng. INFRASTRUCTURE PLANNING ENGINEER (Ext. 5117)**
SUBMITTED BY:	**J. WESTON, M.A.Sc., P. Eng., PMP DIRECTOR OF ENGINEERING**
GENERAL MANAGER APPROVAL:	**R. FORWARD, MBA, M.Sc., P. Eng., GENERAL MANAGER OF INFRASTRUCTURE& GROWTH MANAGEMENT**
CHIEF ADMINISTRATIVE OFFICERAPPROVAL:	**C. LADD CHIEF ADMINISTRATIVE OFFICER**

RECOMMENDED MOTION

1. That the preferred alternative solution for the Foster Drive Area Sanitary Servicing and Stormwater Management Class EA be endorsed as follows:

   a) Sanitary servicing alternative (Alternative 2 – Deep Sewer Alignment); and

   b) Low Impact Development (LID) within the existing road allowance as the stormwater management approach (Alternative 3 – Low Impact Development).

2. That in accordance with the requirements of the Class EA process, the Engineering Department publish a Notice of Completion for this project.

3. That based on the successful conclusion of this Class EA process and available budgets being approved through the capital planning process:

   a) The Engineering Department proceed with the implementation of the preferred alternative solution for sanitary servicing and stormwater management;

   b) That the Director of Legal Services be authorized to commence negotiations for the acquisition of all required property interests;

   c) That the Director of Legal Services be delegated the authority to settle any negotiated agreements up to the maximum amount budgeted for property acquisition; and

   d) That the City Clerk be authorized to execute all associated and required documents in a form approved by the Director of Legal Services.

PURPOSE & BACKGROUND

4. It has been Council's practice to proceed with sanitary servicing of unserviced areas when possible, provided funds are available.

5. The study area includes Foster Drive, Garson Street, MacLaren Avenue, Merrett Drive and Yeates Avenue as shown in Appendix "A".

6. The Lake Simcoe Protection Plan has identified that septic systems within 100m of waterbodies and streams contribute four(4) tonnes of phosphorus per year to Lake Simcoe. The decommissioning of inadequate, malfunctioning and failing septic systems help improve water quality and prevent additional phosphorus loadings to Lake Simcoe.

7. Areas which have been recently serviced with sanitary sewers include Tyndale Road, Cox Mill Road, Gray Lane, Tollendal Mill Road and Bayshore Estates (Pine Drive, Walnut Crescent, Hickory Lane, Cedar Crescent, Cherry Court, Spruce Crescent). Sanitary servicing is scheduled for the Royal Oak Drive neighbourhood in 2016 and be completed in 2018. Jean Street is scheduled to begin in 2018 and be completed in 2019. The Foster Drive area is the next significant settlement area utilizing septic systems.

8. The study area consists of single family residential homes built in the late 1960s. These homes are presently serviced by private on-site septic systems.

9. The Ontario Rural Wastewater Centre states that septic systems have a typical maximum life of 15 to 25 years. The majority of homes within the study area have septic systems approximately 45 to 50 years of age. As the majority of septic systems in the study area are operating significantly beyond their expected service life and in need of repair or replacement; the impetus for this project is to provide the neighborhood with a viable long term sanitary servicing solution that is cost effective and protects the environment.

10. Municipal infrastructure within the study area consists of streets with rural cross-sections, municipal water servicing and roadside ditches (providing stormwater conveyance) with outlets to Whiskey Creek and Lovers Creek. As part of sanitary servicing, it has been the City's practice to fully urbanize streets as part of the overall project scope.

11. R.J. Burnside and Associates Limited were retained to undertake a Municipal Class Environmental Assessment (Class EA) study to find a solution for sanitary servicing in the study area. The City of Barrie Engineering Department assessed stormwater management in the study area.

12. In accordance with the Class EA process, a Public Information Centre (PIC) was held on Wednesday, April 29, 2015, at the Painswick Public Library from 4:00 pm to 7:00 pm to give the interested public and review agencies the opportunity to provide input into the alternatives. Thirty-two (32) people attended the PIC.

13. The following alternatives were presented:

Sanitary Servicing	**Stormwater Management**
Alternative 1 – Do Nothing	Alternative 1 – Do Nothing
Alternative 2 – Deep Sewer Alignment	Alternative 2 – SWM Wet Pond
Alternative 3 – Shallow Sewer Alignment	Alternative 3 – Low Impact Development
	Alternative 4 – Low Impact Development and SWM Dry Pond

A copy of the Class EA Report with details associated with each alternative is available for review in the Councillor's Lounge as well as on the 6th Floor of City Hall, at the Libraries, Clerks Office and the City of Barrie website (www.barrie.ca\eastudies).

ANALYSIS

14. Currently, various municipalities in the Lake Simcoe watershed are requiring landowners whom are experiencing septic system failure or in need of significant repair to connect to the municipal sewage treatment system when available in an effort to improve near-shore water quality by reducing nutrients and pathogens entering Lake Simcoe. Moreover, restricting the replacement or repair of failing on-site septic systems, or the construction of new on-site sewage systems within the municipal boundary is in alignment with the Provincial Policy Statement:

    a) "1.6.6.2 Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas. Intensification and redevelopment within settlement areas on existing municipal sewage services and municipal water services should be promoted, wherever feasible."

15. The Class EA study focused on the evaluation of gravity sanitary sewer options within the study area against the "do-nothing" baseline scenario of maintaining the use of private on-site septic systems.

16. Urbanization of the affected streets required the City to consider and evaluate stormwater management alternatives within the study area to address stormwater quality, quantity and volume / erosion control. The stormwater evaluation focused on urban stormwater management alternatives that can be retrofitted within an existing developed area. Implementation of LID stormwater within the existing road allowance is the recommended stormwater management system for the study area. Implementation of LID's within an existing road allowance is a preapproved activity within the Municipal Class EA Guidelines and does not require the filing of a Notice of Completion. Please refer to Appendix "B" of this staff report for the analysis and recommendations.

    The United States Environmental Protection Agency (U.S. EPA, 2007) and the Credit Valley Conservation Authority defines LID's as follows:

    > "Low impact development (LID) is a stormwater management strategy that seeks to mitigate the impacts of increased runoff and stormwater pollution by managing runoff as close to its source as possible. ....These practices can effectively remove nutrients, pathogens and metals from runoff, and they reduce the volume and intensity of stormwater flows."

    The recommended LID practice is based on a standard sewer system that is modified with two additional perforated sewer pipes that allow stormwater to naturally exit and soak into the ground; thus allowing natural processes to filter stormwater. This action helps replenish groundwater and supports coldwater base flows to nearby Whiskey Creek and Lovers Creek. Significant phosphorus loading reductions will also be realized as LIDs are typically sized to capture the 90th percentile precipitation event; thus 90% of all precipitation events do not produce any runoff and therefore significantly less pollution and nutrients will enter receiving watercourses or lakes.

    The preferred stormwater management alternative is recommended for the following reasons:

    a) Provides a cost effective solution for the provision of stormwater quality treatment to the study area.

    b) Provides the lowest long-term operating costs as compared to the implementation of a stormwater management wet pond.

    c) Supported by the Lake Simcoe Region Conservation Authority.

    d) Complies with the recommendations of the Comprehensive Stormwater Management Master Plan and the Lake Simcoe Protection Plan which promotes the implementation of stormwater management retrofits within existing urban areas to address water quality treatment.

    e) Additional details of the system are included in Appendix "E".

17. Comment sheets containing public/review agency comments and concerns from the PIC have been considered in the development of the preferred alternative. Please see the Class EA Report for detailed comments and responses. For a summary of the major concerns raised and the City's response to those concerns, please see Appendix "C" of this Staff Report. Areas of major concerns include:

    a) Ability to defer or amortize sanitary servicing costs charged to property owners;

    b) Ability to defer connection to the municipal sanitary servicing system if septic system is in good working order or recently replaced; and

    c) Inequities associated with the City's cost apportionment policy application to corner lots.

18. Public responses from the consultation process indicated the following as their preferred alternative:

Sanitary Servicing Alternatives Ranking

Alternative	Alternative 1 - Do Nothing	Alternative 2 - Deep Sewer Alignment	Alternative 3 - Shallow Sewer Alignment
Instances Ranked No. 1	5	17	3

19. Sanitary servicing cost estimates were prepared to compare costs between the alternatives with the baseline scenario ("do-nothing") assuming septic system replacement for all residences. The cost estimates includes costs for sanitary servicing, road restoration within the municipal right-of-way (ROW) and residential plumbing costs to connect the sanitary lateral at property line to the residence (where applicable) and are summarized below:

Sanitary Servicing Capital Cost Estimates

	Alternative 1 - Do Nothing	Alternative 2 - Deep Sewer Alignment	Alternative 3 - Shallow Sewer Alignment
Sanitary Servicing Costs and Road Restoration to Existing Conditions	$0	$3.25M	$3.15M
Septic System Replacement[1]	$2.1M	$0	$0
Residential Plumbing Costs[1]	$0	$0.35M	$0.35M
Total Cost	**$2.1M**	**$3.55M**	**$3.45M**
Estimated Cost per Residential Lot [1,2]	$22,000	$10,000 - $14,000	$10,000 - $13,000
Estimated Cost Recovery[3]	$0	$1.2M	$1.1M

1 – Private cost.
2 – Alternative 1 includes septic system replacement. Alternative 2 and 3 include sanitary servicing based on 18.5 m frontage and private plumbing costs to connect to the sanitary lateral at property line.
3 – Estimated cost recovery under Section 326 of the Municipal Act based on 90% cost recovery of eligible sanitary servicing costs.

20. It is the City's practice to complete sanitary servicing works that are of local benefit under Section 326 of the Municipal Act. This act provides municipalities the authority to raise costs associated with such works from the benefiting property owners. As part of detailed design, costs will be assessed to each benefiting property according to their respective frontages. Sanitary servicing costs will be recovered, though a portion of non-assessable frontage costs must be paid for by the City (i.e. park frontages, street intersections, flankage of corner lots) through the wastewater user rate. The City's municipal servicing cost apportionment policy is included in Appendix "D".

Note that the City's current practice is to recover road restoration costs up to and including base asphalt for a 3 m wide trench. The remaining road restoration costs are paid for by the City and funded through tax capital reserve. This approach is used to maintain financial viability to residents subject to cost recovery and to recognize that these roads are also utilized by residents outside the servicing area.

21. The alternatives were evaluated in consideration of comments received to determine the best design alternative based on pre-determined criteria and the relative importance of the criteria. Alternative 2 – Deep Sewer Alignment has been selected as the preferred alternative solution. The scoring of the alternative can be found in the Class EA Report.

22. The preferred sanitary servicing alternative consists of open-cut gravity sewers intended to provide basement gravity servicing to the majority of homes. There may be specific instances where only first floor gravity servicing is available due to sewer depth constraints. Through the conceptual design process, the project team has identified 238 and 242 Foster Drive for first floor gravity servicing as the homes are situated too low, relative to Foster Drive, to allow for basement gravity servicing (these homes do not have basements and are not presently impacted). Staff will confirm basement elevations during the design process and communicate updates regarding sanitary servicing to residents.

23. The preferred sanitary servicing alternative is recommended for the following reasons:

a) Addresses renewal needs associated with private septic systems in a cost effective manner;

b) Reduces potential impacts to groundwater and surface water quality of Whiskey Creek as a result of aging septic systems;

c) Provides basement level gravity servicing to the majority of residences;

d) Minimizes impacts to future development parcels (223 Foster Drive and 357 Yonge Street) as the preferred alternative is routed through a previously proposed future ROW connecting Merrett Drive and Foster Drive; and

e) Facilitates the cost effective implementation of capital improvements within the study area (road urbanization, watermain replacement and active transportation).

24. Preliminary project phasing is recommended for this project based on sewershed boundaries and dependencies associated with sewershed outlets as well as the required routing of the sanitary sewer through 223 Foster Drive; see Appendix "F" for phasing boundaries. The recommended preliminary phasing is as follows:

Preliminary Project Phasing

Project Phasing	Sanitary/Storm Outlet	Phase Dependencies/Notes
Phase 1	Little Avenue	Independent phase
Phase 2a	Yonge Street/Whiskey Creek	Independent phase
Phase 2b – 223 Foster Drive	Foster Drive	Phase 2a – requires land dedication or expropriation from 223 Foster Drive
Phase 2c	Foster Drive via 223 Foster Drive	Phase 2b

Phase 1 and 2a are recommended for Construction Year 1. Phase 2b and 2c are recommended for Construction Year 2. Project phasing will be confirmed during detailed design.

25. The implementation of Phases 2b and 2c requires property or an easement from 223 Foster Drive. This property is presently undeveloped, but has been subject to a past development application which has expired. The current zoning by-law identifies this property as R2/R3 and illustrates the proposed municipal ROW linking Merrett Drive to Foster Drive. The alignment of the sewer coincides with the proposed ROW. The City will seek to acquire the future road ROW as part of future development approval. If development approval and City construction schedules do not coincide, the City would seek to acquire either the road ROW or an easement for a utility corridor through this property. Appendix "G" illustrates the sewer alignment through 223 Foster Drive and property (or easement) requirements.

The acquisition of an easement through 223 Foster Drive is estimated to be approximately $40,000. This cost is in addition to the sanitary servicing capital cost estimate.

26. Asset conditions within the study area are as follows:

Study Area Asset Condition Summary

Street	Road Structure	Watermain
Foster Drive	Very Poor	Very Good
Garson Street	Very Good	Poor
MacLaren Avenue	Very Good	Poor
Merrett Drive	Very Good to Good	Poor
Yeates Avenue	Very Good	Poor

The watermains on Garson Street, MacLaren Avenue, Merrett Drive and Yeates Avenue are 50 years old and have an expected remaining service life of 20 years (70 years total service life). Based on the expected service life of the reconstructed road (60 years), it is recommended that watermain replacement is included in the project scope. The watermain on Foster Drive was installed in 2003 and is not recommended for replacement. The proposed sanitary sewers and storm sewers / LID's will be installed under the existing road structure therefore the existing road which is in good to very good condition will need to be reconstructed to facilitate the implementation of the recommended sanitary sewers and storm sewers / LID's.

It is important to note that the age and condition of existing septic systems is the impetus for this project.

27. Based on past City of Barrie practice, affected streets are recommended to be restored to an urban cross-section (urbanization) including sidewalks as per the Multi-modal Active Transportation Master Plan and include watermain replacement. Watermain and sidewalk alignments will be determined as part of detailed design.

Preliminary cost estimates to implement this work are as follows:

Project Phasing Capital Cost Estimate

Project Phase	Watermain	Sanitary and Road Restoration to Ex. Cond.	Additional Cost to Urbanize[1]	Total Capital Cost	Estimated Cost Recovery[3]
Phase 1	$0.20M	$0.80M	$0.90M	**$1.90M**	$0.32M
Phase 2A	$0.04M	$1.35M	$1.40M	**$2.80M**	$0.44M
Phase 2B[2]	NA	$0.10M	$0.10M	**$0.20M**	$0.08M
Phase 2C	$0.30M	$1.00M	$1.10M	**$2.40M**	$0.35M
Total	**$0.55M**	**$3.25M**	**$3.50M**	**$7.30M**	**$1.20M**

1 – Includes costs for curbs, sidewalk, storm sewer and LID stormwater treatment system.
2 – Phase 2B urbanization costs include installation of storm sewer (only) to provide outlet for Phase 2C.
3 – Estimated Section 326 cost recovery based on 90% cost recovery of eligible sanitary servicing costs.

The planning level cost estimate includes engineering (15%) and contingency (30%) for all components except sanitary servicing, where the allowances were reduced to 10% for the purposes of estimating residential frontage charges as per the Consultant's sanitary servicing cost estimate.

ENVIRONMENTAL MATTERS

28. The following environmental matters have been considered in the development of the recommendation:

    a) The Lake Simcoe Protection Plan; and

    b) Provincial Policy Statement.

29. The City of Barrie's continued efforts in reducing phosphorus loads to Lake Simcoe demonstrate an environmental commitment by the City of Barrie to making a positive change within the Lake Simcoe Watershed and ensures that the City stays at the forefront of environmental issues that affect Lake Simcoe.

ALTERNATIVES

30. There are two alternatives available for consideration by General Committee:

Alternative #1 General Committee could alter the proposed recommendation by selecting another preferred alternative solution for sanitary servicing and stormwater management.

This alternative is not recommended as the preferred alternative solution provides sanitary servicing and stormwater quality improvements with minimal effects on the natural, social and economic environments.

Alternative #2 General Committee could defer urbanization and perform restoration to existing conditions (maintain rural cross-section).

This alternative is not recommended as urbanization will allow implementation of the City's standard urban cross-section consistent with residential areas throughout the City and allows the provisioning of sidewalks, storm sewers and stormwater treatment (LID).

FINANCIAL

31. The costs associated with the Foster Drive Area Sanitary Servicing and Stormwater Management have been included in years 2017, 2019 and 2020 of the 2016 - 2025 Capital Plan.

Actual project timing may change due to annual capital budget prioritization and will be subject to Council approval. Costs will be reviewed and updated through the 2017 business planning process and will be refined through the design phase. This update will include an allowance for property acquisition in 2018.

32. The additional annual operating cost for the preferred alternatives including urbanization is as follows:

Operating Costs

Element	Annual Operating Costs
Sidewalks	$ 5,000
Sidewalks – Winter Maintenance	$ 3,600
Sanitary Sewers	$11,500
Stormwater Collection	$ 7,400
Stormwater Treatment (LID)	$ 6,000
Total	**$33,500**

33. The proposed sanitary servicing works are recommended to be constructed under the authority of Section 326 in the Municipal Act. A By-law is required for authority to proceed with construction. The cost of sanitary servicing (excluding watermain replacement, urbanization and stormwater management) will be assessed by frontage to the benefitting property owners, based on the actual construction costs.

LINKAGE TO 2014 – 2018 COUNCIL STRATEGIC PLAN

34. The recommendations included in this Staff Report support the following goals identified in the 2014-2018 Strategic Plan:

☒ Responsible Spending

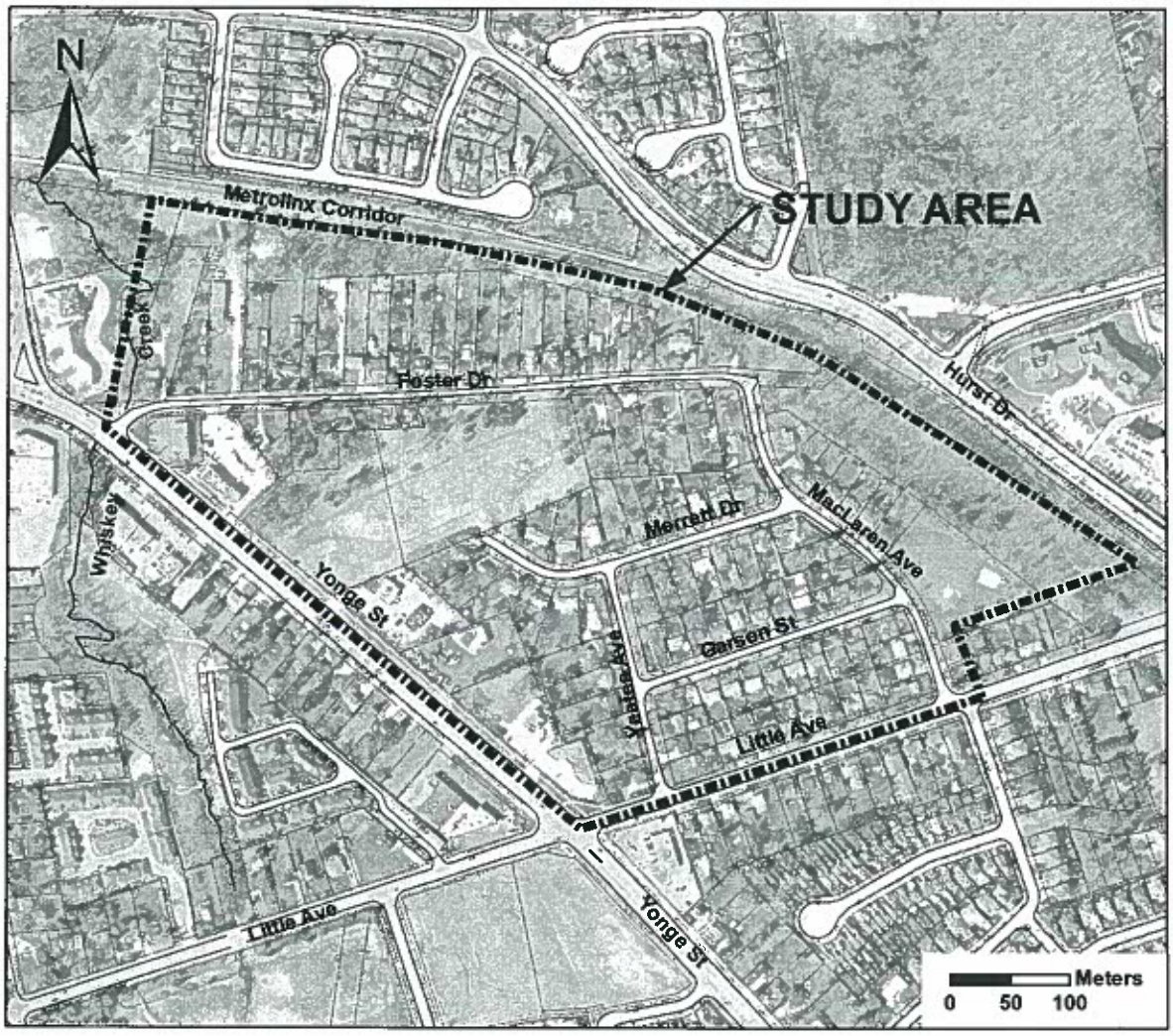
☒ Inclusive Community

35. The implementation of the preferred alternatives, urbanization and watermain replacement is the most cost effective approach to complete this work as it eliminates risks of throwaway costs.

36. The implementation of sidewalks as part of urbanization will improve accessibility and safety for current and future generations of residents in this neighbourhood.

APPENDIX "A"

Study Area



APPENDIX "B"

Study Area Stormwater Management

1. As part of urbanization of existing streets; the implementation of storm sewers requires the consideration of stormwater management (SWM) as the uncontrolled and untreated discharge to Whiskey Creek and Lovers Creek will further exacerbate downstream erosion and impair water quality. The Class EA study considered various alternatives to provide stormwater quality treatment, quantity and erosion control.

2. Public responses from the consultation process indicated the following as their preferred alternative:

Stormwater Management Alternatives Ranking

Alternative	Alternative 1 - Do Nothing	Alternative 2 - SWM Wet Pond	Alternative 3 - Low Impact Development (LID)	Alternative 4 - LID and SWM Dry Pond
Instances Ranked No. 1	8	2	9	6

3. Cost estimates were prepared to compare the additional costs to provide stormwater quality treatment (excludes costs associated with standard stormwater conveyance infrastructure) and are summarized below:

Stormwater Quality Treatment Capital Cost Estimate

	Alternative 1 - Do Nothing	Alternative 2 - SWM Wet Pond	Alternative 3 - LID	Alternative 4 - LID and SWM Dry Pond
Total Costs	NA[1]	$1.3M	$0.5M	$1.9M

1 – Does not account for environmental impact costs associated with watercourse degradation and water quality impacts

4. The alternatives were evaluated in consideration of comments received to determine the best design alternative based on pre-determined criteria and the relative importance of the criteria. Alternative 3 – LID has been selected as the preferred alternative solution. The scoring of the alternative can be found in the Class EA Report.

5. The preferred stormwater management alternative consists of low impact development (LID) practices installed within the municipal ROW. The recommended LID practice is based on a standard sewer system that is modified with two additional perforated sewer pipes that allow stormwater to naturally exit and soak into the ground; thus allowing natural processes to filter stormwater. Details of the system are included in Appendix "E".

6. The annual operating cost for the preferred SWM alternative is approximately $6,000.

7. For comparison, the operating costs of a traditional SWM system with wet pond sized for this catchment, utilizing maintenance intervals recommended in the Ministry of the Environment and Climate Change (MOECC) SWM Planning and Design Manual, is approximately $18,000 per year.

APPENDIX "C"

Summary of Major Concerns and City Response

	COMMENT	RESPONSE
1	Concerned with the cost implications for Sanitary Servicing.	The City allows residents to defer connection to the sanitary sewer system. This allows residents to defer the private costs associated with connecting to the sanitary system and user rate charges. The frontage costs cannot be deferred, but the City allows residents to finance the frontage costs over 10 years, resulting in a more manageable cost.
2	Concerned about being required to connect to the new sanitary sewer given the existing septic system was recently replaced.	The City allows residents to defer connection to the City's sanitary sewer system until the time your septic system requires replacement; thus eliminating the need to pay user rate charges during this period. Frontage fees must be paid at the time of construction; this includes a sanitary lateral to the property line to allow future connection. Frontage fees can be paid over 10 years.
3	Concerned about how frontage costs are calculated; in particular with respect to corner lots.	The City will further assess the cost apportionment policy during detailed design.

APPENDIX "D"

Schedule "A" of Local Improvement and Section 326 (Municipal Act) Servicing Cost Apportionment Policy

2 **Bill No. 046**

Schedule "A"

Local Improvement and Section 326 (Municipal Act) Servicing Cost Apportionment Policy

1. Lots that do not have a front and rear yard width that differ by more than 6 metres are considered regular-shaped and will be assessed their share of the costs utilizing their actual frontage on the works.

2. Triangular or irregularly-shaped lots defined as having front and rear width distances that differ by more than 6 metres are to be assessed their share of the costs by adding the front and rear width and dividing by two. This is to apportion costs on a "just and equitable basis having regard to the situation, value and area of the lot compared to other lots" as described in Ontario Regulation 586/06. If as a result of the averaging the adjusted frontage is greater than 30 metres then the property will be assessed 30 metres.

3. Lots with frontage in excess of 30 metres that will not derive any additional benefit as other lots will have their assessed frontage adjusted to 30 metres. In the event the lot is severed/sub-divided in the future the new lot(s) will be assessed frontage costs at the same per metre rate as the original works and such costs will be payable in full as a condition of the granting of the severance/plan of sub-division.

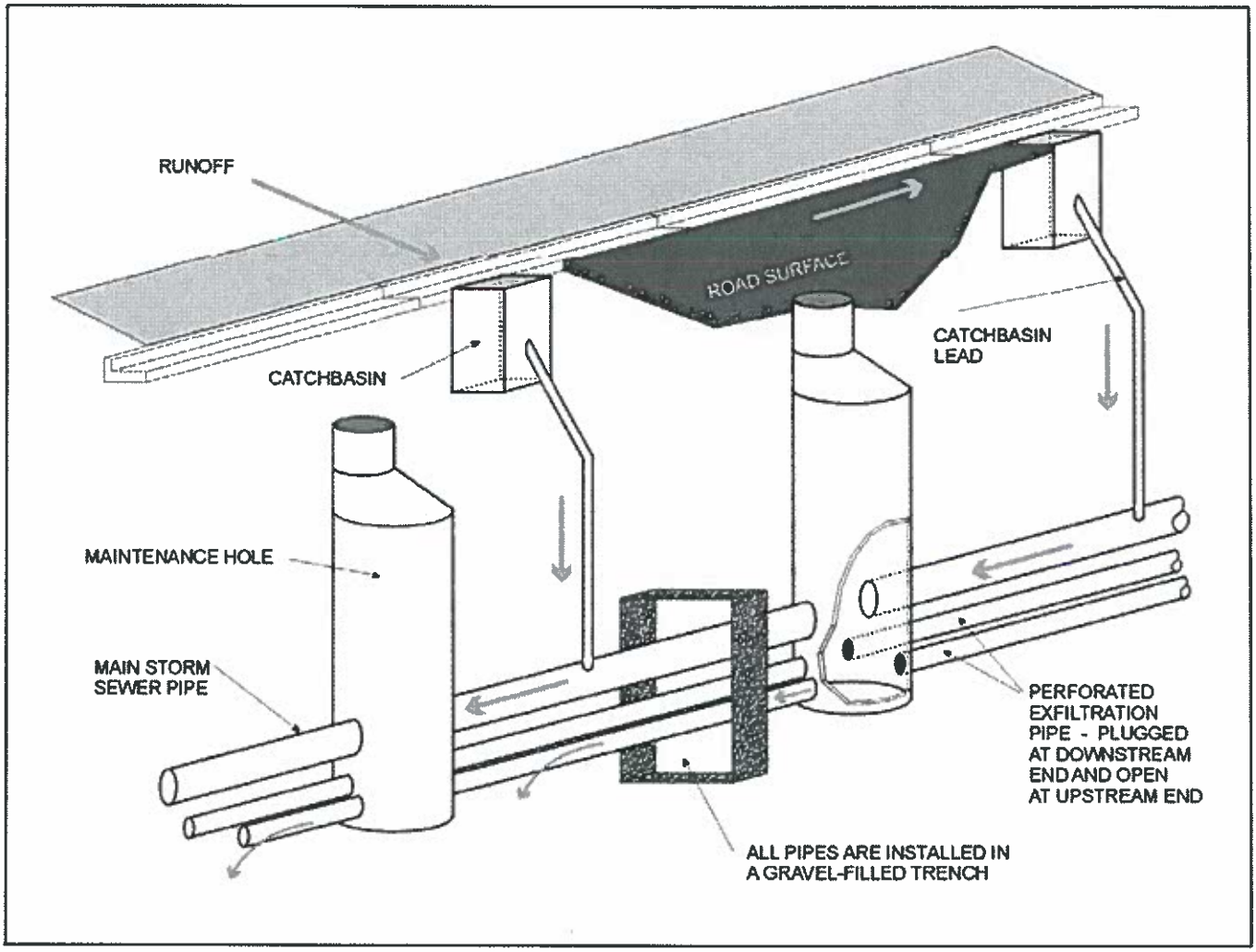
4. For lots where the works abut only a portion of a property frontage the property will be assessed costs based on the average of the frontages of regular shaped lots affected by the works. In situations where the property has already been assessed some portion in the past for similar type works then a reduction would be to the assessed frontage to recognize the previous charge.

5. For corner lots that are affected by works that abut both their frontage and side (flankage) yards the full amount of the flankage will be exempt from charges until such time that a severance is requested. In the event the lot is severed in the future the new lot will be assessed frontage costs at the same per metre rate as the original works and such costs will be payable in full as a condition of the granting of the severance.

6. For lots that have both their front and rear yards abut on the works then rear portion will be exempted from charges until such time that a severance is requested. In the event the lot is severed in the future the new lot will be assessed frontage costs at the same per metre rate as the original works and such costs will be payable in full as a condition of the granting of the severance.

APPENDIX "E"

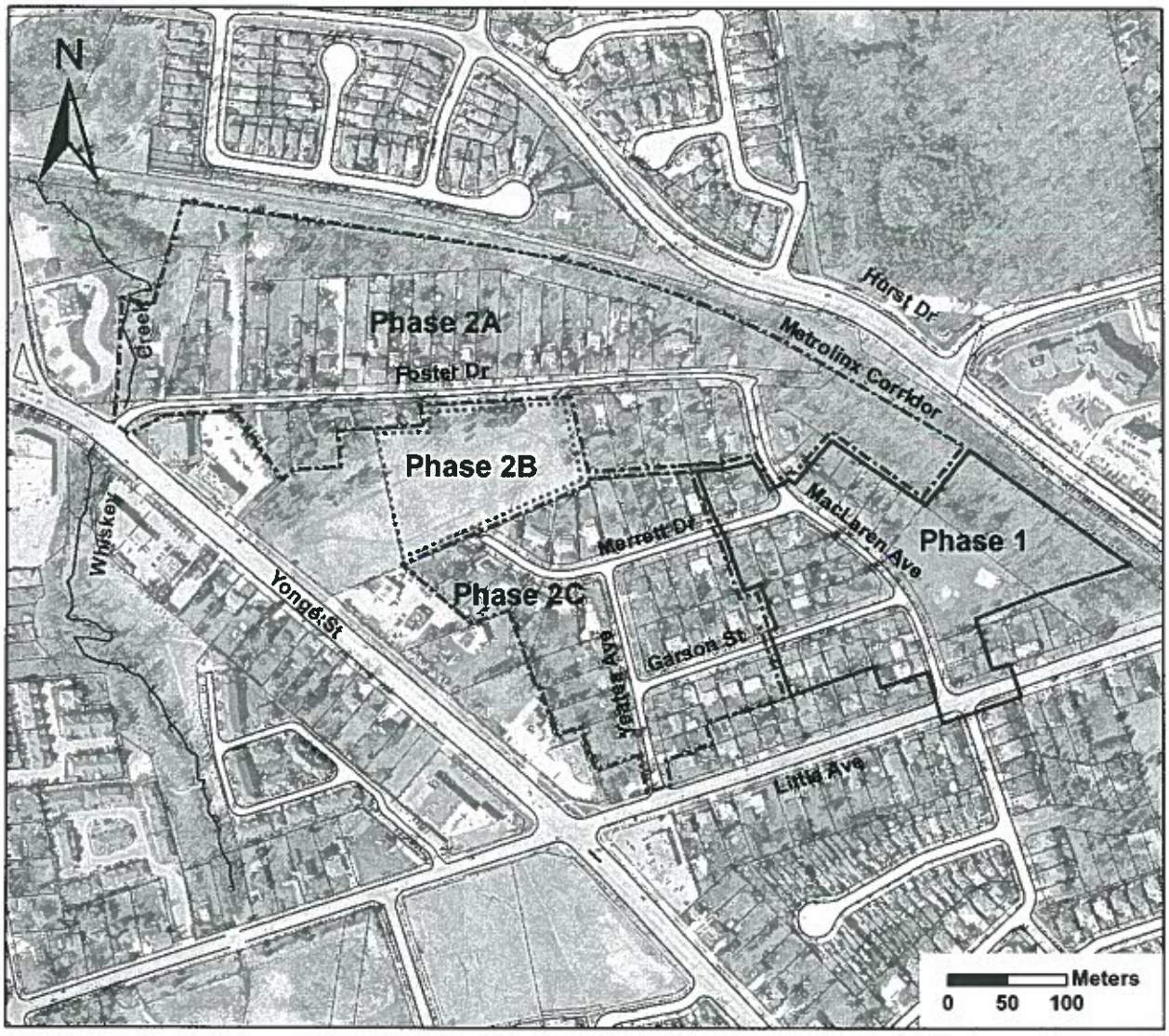
LID Stormwater Exfiltration System



Source: www.sustainabletechnologies.ca

APPENDIX "F"

Preliminary Project Phasing Map



APPENDIX "G"

Property Requirements